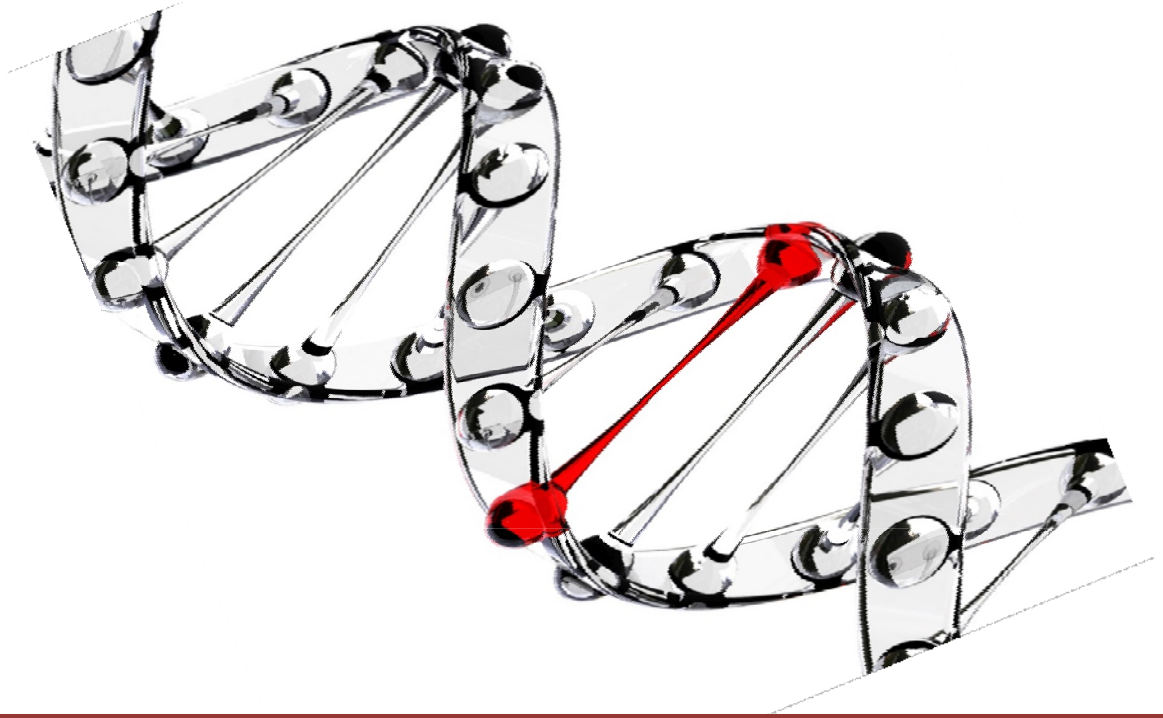

Investor Presentation

May, 2018

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Forward Looking Statements

This presentation contains forward-looking statements regarding the Company's business and the therapeutic and commercial potential of its technologies and products in development. Any statement describing the Company's goals, expectations, intentions or beliefs is a forward-looking statement and should be considered an at-risk statement. Such statements are subject to certain risks and uncertainties, particularly those risks or uncertainties inherent in the process of developing technology and in the process of discovering, developing and commercializing drugs that can be proven to be safe and effective for use as human therapeutics, and in the endeavor of building a business around such products and services. Actual results could differ materially from those discussed in this presentation. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in the Antisense Therapeutics Limited Annual Report for the year ended 30 June 2017 and Appendix 4D for the half year ended 31 December 2017, copies of which are available from the Company or at www.antisense.com.au.

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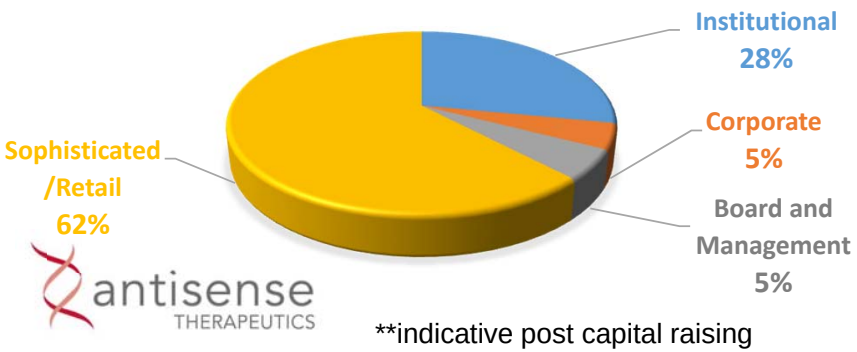
Corporate Overview

Key Financials	
Market Capitalisation @ 30 April'18	**A$5M**
Cash as at 31 March 2018*	**A$562K**
Shares on issue @ 30 April'18	**186M**
Share price (12 month)	**$0.02 - $0.06**

*Not including **$5M** from institutionally backed capital raising

Ownership Structure**



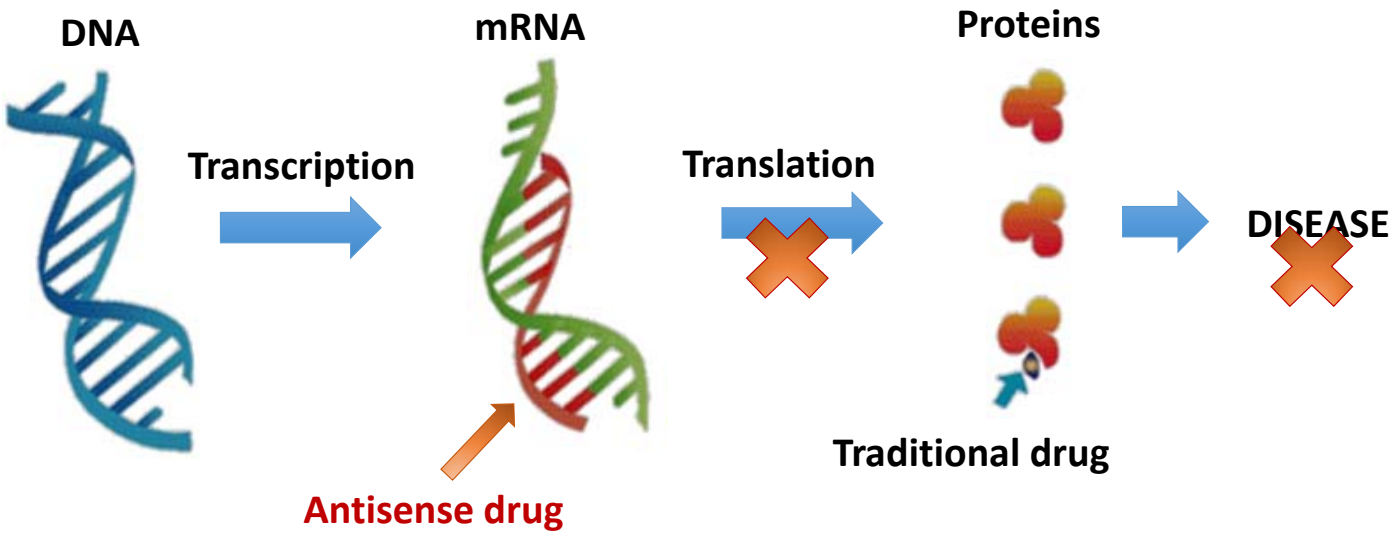
**indicative post capital raising

Mr Robert W Moses Independent Non-Executive Chairman	Formerly Corporate Vice President of CSL Limited. Mr. Moses draws on more than 40 years' experience in the pharmaceutical/biotechnology industry.
Mr Mark Diamond Managing Director & Chief Executive Officer	Over 26 years' experience in the pharmaceutical and biotechnology industry. Formerly Director, Project Planning/Business Development at Faulding Pharmaceuticals in the USA, in-licensing within Faulding's European operation and International Business Development Manager in Australia.
Dr Graham Mitchell Independent Non-Executive Director	Joint Chief Scientist for the Victorian Government Department of Environment and Primary Industries. Formerly Director of Research in the R&D Division of CSL Limited.
Dr Gary Pace Independent Non-Executive Director	Dr Pace has more than 40 years' international experience in the development and commercialization in biotechnology/pharmaceuticals industries. Long-term board level experience with both multi-billion and small cap companies.
Mr William Goolsbee Independent Non-Executive Director	Founder, Chairman and CEO of Horizon Medical Inc. 1987 – 2002 until acquisition by UBS Private Equity. Founding Director then Chairman of ImmunoTherapy Corporation until acquisition by AVI Biopharma, Inc. (now Sarepta Therapeutics). Former Chairman of privately held BMG Pharma LLC and Metrodora Therapeutics.

Corporate Snapshot

- ✓ Developing RNA-targeted therapeutics from Ionis Pharmaceuticals (NASDAQ:IONS, market capitalisation:US$6Billion), a world leader in antisense drug development and commercialisation
- ✓ Advanced stage product pipeline with two compounds (ATL1102 and ATL1103/atesidorsen) that have delivered positive Phase 2 clinical results
- ✓ $5 million transformational capital raising backed by leading institutional investors (Australian Ethical Investment to become largest shareholder with 19.9% holding) to be completed 7 May'18
- ✓ Capital raised to complete ATL1102 Phase II clinical trial in Duchenne Muscular Dystrophy patients and to initiate the ATL1103 Early Access Program in Acromegaly
- ✓ **Duchenne Muscular Dystrophy (DMD) Program**
  - *DMD is one of the most common fatal genetic disorders and is caused by a mutation in the muscle dystrophin gene leading to severe progressive muscle loss and premature death - high unmet medical need for new therapeutics*
  - *Phase II clinical trial of ATL1102 in DMD patients to be conducted at Royal Childrens Hospital, Melbourne. Patient enrolment anticipated to commence in Q2'18*
- ✓ **Early Access Program (EAP)**
  - *Plan to provide ATL1103 to acromegaly patients under an EAP in Europe. EAPs offer patients access to new non-registered drugs where Company's can charge for drug supply in certain markets. ANP has supplies of ATL1103 to potentially treat approx. 15 patients for 1 year*
  - *Anticipate initiation of EAP in Q3'18*

Antisense - what is it and how does it work?



- *Antisense oligonucleotide drugs are small (12-25 nucleotides) DNA- or RNA-like compounds that are chemically modified to create medicines*
- *Antisense drugs prevent the production of proteins involved in disease processes by interrupting the translation phase of the protein production which results in a therapeutic benefit to patients*

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Product Pipeline

- Advanced stage pipeline for diseases where there is a need for improved therapies
- World-wide exclusive license from Ionis Pharmaceuticals to compounds for all disease applications

ATL1102 in DMD	ATL1103 in acromegaly	ATL1102 in MS
• *Ethics approval received for conduct of Phase II clinical trial in Australia*	• *Phase II clinical trial completed* • *To commence Early Access Program in Europe*	• *Phase II clinical trial completed* • *To establish plan/conditions for dosing in future clinical studies*

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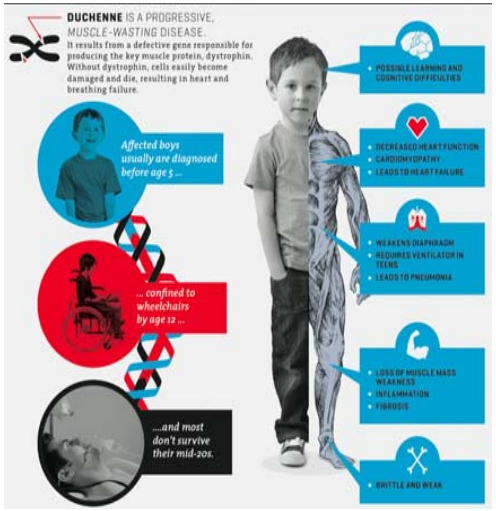
ATL1102 for Duchenne Muscular Dystrophy

- Duchenne Muscular Dystrophy (DMD) is a devastating genetic muscular disease caused by loss of dystrophin with progressive muscle wasting and associated muscle injury leading to inflammation and fibrosis (100% mortality)
- DMD affects boys with an incidence of ~1 in 3,500 and prevalence of ~44,000 in US & EU
- Dystrophin restoration treatments have recently been approved – eteplirsen (Exondys 51:Sarepta Therapeutics) for the 13% of DMD children amenable to Exon 51 skipping
- Key challenge in management of DMD patients is to reduce the inflammation that exacerbates muscle fibre damage
- Corticosteroids used to treat the inflammation in DMD but have insufficient efficacy and significant side effects
- Improved anti-inflammatory therapies are needed to ameliorate DMD severity and delay disease progression
- DMD patients with greater no of circulating T cells with high levels of CD49d (alpha chain of VLA-4) expression have both more severe and rapid progression of disease [*Pinto-Mariz et al Skeletal Muscle 2015(5:45)*].
- ATL1102 is a highly active immunomodulatory antisense drug to human CD49d RNA that has shown potent effects on inflammatory processes in MS patients
  - *Demonstrated a 90% reduction in inflammatory MS brain lesions vs placebo after only 8 weeks of dosing**
  - *Reduced CD49d on T and B cells, and T and B cell numbers by ~25 and 50% respectively in MS patients**



*Limmroth V et al Neurology 2014, 83; 1-9

Validation for targeting CD49d for treating inflammation in DMD

- Key scientific publication confirms CD49d (biological target of ATL1102) as a potential target for DMD therapy
- Supports/validates approach of using ATL1102 to decrease inflammation mediated tissue damage in DMD

Pinto-Mariz *et al. Skeletal Muscle* (2015) 5:45
DOI 10.1186/s13395-015-0066-2

Skeletal Muscle

RESEARCH Open Access

CD49d is a disease progression biomarker and a potential target for immunotherapy in Duchenne muscular dystrophy

Fernanda Pinto-Mariz[1,2,3], Luciana Rodrigues Carvalho[1], Alexandra Prufer De Queiroz Campos Araujo[2], Wallace De Mello[1], Márcia Gonçalves Ribeiro[2], Maria Do Carmo Soares Alves Cunha[2], Pedro Hernan Cabello[6], Ingo Riederer[1], Elisa Negroni[3], Isabelle Desguerre[5], Mariana Veras[1], Erica Yada[3], Yves Allenbach[6], Olivier Benveniste[6], Thomas Voit[3], Vincent Mouly[3], Suse Dayse Silva-Barbosa[1,7], Gillian Butler-Browne[3*] and Wilson Savino[1*]

Abstract

Background: Duchenne muscular dystrophy (DMD) is caused by mutations in the dystrophin gene. The immune inflammatory response also contributes to disease progression in DMD patients. In a previous study, we demonstrated higher levels of circulating CD49dhi and CD49ehi T cells in DMD patients compared to healthy control. DMD patients are clinically heterogeneous and the functional defect cannot be correlated with genotype. Therefore, it is important to be able to define reliable noninvasive biomarkers to better define the disease progression at the beginning of clinical trials.

Results: We studied 75 DMD patients at different stages of their disease and observed that increased percentages of circulating $CD4^+CD49d^{hi}$ and $CD8^+CD49d^{hi}$ T lymphocytes were correlated with both severity and a more rapid progression of the disease. Moreover, T^+CD49d^+ cells were also found in muscular inflammatory infiltrates. Functionally, T cells from severely affected patients exhibited higher transendothelial and fibronectin-driven migratory responses and increased adhesion to myotubes, when compared to control individuals. These responses could be blocked with an anti-CD49d monoclonal antibody.

Conclusion: CD49d can be used as a novel biomarker to stratify DMD patients by predicting disease progression for clinical trials. Moreover, anti-CD49d peptides or antibodies can be used as a therapeutic approach to decrease inflammation-mediated tissue damage in DMD.

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ATL1102 for DMD - Scientific Advisory Board

Dr. Ian Woodcock MD (Principal-Investigator)

Royal Childrens Hospital (RCH) Neuromuscular Fellow, Melbourne Australia

Professor Monique Ryan MD (Co- Investigator)

Director Neurology Department, Head of Royal Children's Hospital, Neuromuscular Clinic RCH, MCRI, Melbourne Australia

Professor Steve Wilton Ph.D

Western Australian Neuroscience Research Institute (NRI), Foundation Chair in Molecular Therapy at Murdoch University, Perth, Western Australia: Inventor of Sarepta's drug eteplirsen to repair dystrophin in DMD

Professor Sue Fletcher, PhD

Principal Research Fellow, NRI Murdoch University, Perth, Western Australia: Inventor of Sarepta's drug eteplirsen to repair dystrophin in DMD

Dr. Gillian Butler-Browne, PhD

Director, Centre of Research in Myology, Sorbonne Universités, INSERM, Paris, France: Expert in inflammatory muscle disease

Mr William Goolsbee

Antisense Therapeutics Ltd, non- executive director: Chairman, Sarepta Therapeutics, 2010-2014, Developers of eteplirsen for the treatment of DMD

DMD Program Status – Phase II clinical trial

- ANP to conduct a Phase II trial in DMD patients at the Royal Childrens Hospital (RCH) Melbourne
  - *RCH ethics committee approval has been received*
  - *Study in wheel chair bound boys 10 to 17 years of age with DMD to assess ATL1102's safety and tolerability and its effects on the inflammation that contributes to disease progression in DMD*
  - *24 week dosing at 25mg/week (or 0.42-1mg/kg/week) in DMD patients weighing 25-60kg*
  - *Study is a safety and tolerability investigation while also looking to show a difference in serum biomarkers of inflammation and muscle damage and to detect a difference at 6 months in key clinical endpoints (e.g. the upper limb function of the boys)*
- Trial costs eligible for R&D tax incentive refund
- GMP manufacturing of ATL1102 drug substance (DS) is complete and has been formulated into injectable product for use in clinical trials
- Commencement of patient enrolment anticipated in Q2'18
- Based on current study timeline projections, dosing of patients is to be completed by Q1'19 with study results to follow in Q2'19

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Value Creation Potential of ATL1102 for DMD



The Market

- Therapeutic treatments market for DMD is forecast to be US$1Billion by 2019
- Market forecast driven by the FDA approval in Sep 2016 of Exondys 51 (eteplirsen) an oligonucleotide drug for DMD by Sarepta Therapeutics Inc.
- All DMD patients experience inflammation and so present as a potential market for ATL1102 treatment
- 44,000 DMD patients in US and EU = multiple billion $ sales potential



A case study – Sarepta Therapeutics Inc

- Prior to the approval of Exondys 51, Sarepta had a market capitalisation (m/c) of ~US$60m (July 2012). Following FDA approval of Exondys 51 Sarepta's m/c peaked at US$3.3Billion (current m/c US$5.2Billion)
- Exondys 51 is the first FDA approved treatment for DMD, however is only useful in13% of boys with the exon 51 mutation, where as inflammation contributes to disease progression in all DMD patients
- Cost per patient of Exondys 51 is US$300K/year. Sarepta 2017 annual revenue guidance for Exondys 51 US$150 million
- Notably, Mr William Goolsbee, ex Chairman of Sarepta, is a non-executive director of ANP and Exondys 51 inventor, Professor Steve Wilton (Murdoch University, Perth) is a member of the ANP scientific advisory board



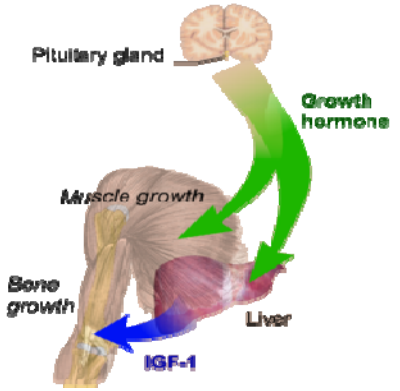
A local peer company (Neuren Pharmaceuticals Limited: ASX:NEU)

- Neuren is a biopharmaceutical company developing therapies for brain injury, neurodevelopmental and neurodegenerative disorders.
- Neuren presently has trofinetide in Phase 2 clinical trials for orphan indications (like DMD) as well as NNZ-2591 in pre-clinical development
- Current m/c A$300 million

ATL1103 for Acromegaly

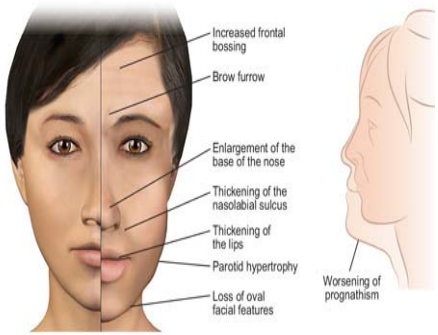
Acromegaly

- Abnormal enlargement of organs and bones of the face, feet and hands
- Due to a benign tumor of the pituitary gland causing excess Growth Hormone and Insulin-like Growth Factor 1 (sIGF-I) leading to diabetes, hypertension, and cancer (increased mortality rate up to 2.7x normal)
- Affects ~85 per million in the US and Europe (~85,000 adults): Orphan disease = incentives to develop
- Global sales for acromegaly drug treatment ~ $1B/annum



ATL1103

- ATL1103 (generic name – atesidorsen) reduces expression of GHr in the liver & blocks GH action on the liver, which reduces serum IGF-I
- Normalising sIGF-I is the treatment goal in acromegaly
- ATL1103 has suppressed sIGF-I in all animal and human studies undertaken to date including successful Phase II clinical trials
- **ATL1103 initially targeted for first line therapy failures -** potential advantages include lower cost of therapy, improved safety profile, and more convenient dosing and administration



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Acromegaly Program Status – Early Access Program

- Early Access Program (EAP)
  - *Allow biopharmaceutical companies to provide eligible patients with access to investigational medicines for unmet medical needs within the scope of the existing early access legislation*
  - *Access is provided in response to physician requests where other treatments have been unsuccessful and no alternative or appropriate treatment options are available to these patients*



- **Agreement with myTomorrows** to provide ATL1103 under an EAP in Europe in countries where can charge for drug
  - *ANP has sufficient supplies of ATL1103 raw material to potentially treat approximately 15 patients for 1 year*
  - *Potential for income generation - current average cost for 2nd line acromegaly treatment in Europe is approximately A$80K per patient per annum*.
  - *Possible for ANP to make larger batches of ATL1103 for future EAP supply*

myTomorrows

- Formulation of existing drug compound into injectible product for EAP scheduled for late May 2018
- Working with myTomorrows on the documentation required for the regulatory approvals to supply atesidorsen product under an EAP with aim to initiate atesidorsen EAP treatments in 3'Q'18.



ATL1102 for Multiple Sclerosis

Multiple Sclerosis (MS)

***Limmroth, V. et al Neurology, 2014; 83(20): 1780-1788**

- MS is a chronic, progressive, and debilitating autoimmune disease that affects central nervous system, brain and spinal cord
- Approx. 400,000 people in North America and more than 2.5 million worldwide with MS



Published Ahead of Print on September 10, 2014 as 10.1212/WNL.0000000000000926

CD49d antisense drug ATL1102 reduces disease activity in patients with relapsing-remitting MS

OPEN

Volker Limmroth, MD
Frederik Barkhof, MD, PhD
Nuker Deuen, MBA
Mark P. Diamond, MBA
George Tachas, PhD
For the ATL1102 Study Group

ABSTRACT

Objective: This study evaluated the efficacy and safety of ATL1102, an antisense oligonucleotide that selectively targets the RNA for human CD49d, the α subunit of very late antigen 4, in patients with relapsing-remitting multiple sclerosis (RRMS).

Methods: In a multicenter, double-blind, placebo-controlled randomized phase II trial, 77 patients with RRMS were treated with 200 mg of ATL1102 subcutaneously injected 3 times in the first week and twice weekly for 7 weeks or placebo and monitored for a further 8 weeks. MRI scans were taken at baseline and weeks 4, 8, 12, and 16. The primary endpoint was the cumulative number of new active lesions (either new gadolinium-enhancing T1 lesions or nonenhancing new or enlarging T2 lesions) at weeks 4, 8, and 12.

Results: A total of 72 patients completed the study and 74 intention-to-treat patients were assessed. ATL1102 significantly reduced the cumulative number of new active lesions by 54.4% compared to placebo (mean 3.0 [SD 6.12] vs 6.2 [9.89], $p = 0.01$). The cumulative number of new gadolinium-enhancing T1 lesions was reduced by 67.9% compared to placebo ($p = 0.002$). Treatment-emergent adverse events included mild to moderate injection site erythema and decrease in platelet counts that returned to within the normal range after dosing.

Conclusions: In patients with RRMS, ATL1102 significantly reduced disease activity after 8 weeks of treatment and was generally well-tolerated. This trial provides evidence for the first time that antisense oligonucleotides may be used as a therapeutic approach in neuroimmunologic disorders.

Classification: This study provides Class I evidence that for patients with RRMS, the antisense oligonucleotide ATL1102 reduces the number of new active head MRI lesions. Neurology® 2014;83:1-9

ATL1102

- Successful Phase II trial in patients with Relapsing Remitting-MS with trial results published in Journal of Neurology*
- ANP submitted a US IND application for a 6 month, Phase 2b human trial at a dose of 100mg and 200mg per week in relapsing MS (relapsing remitting and relapsing secondary progressive MS). FDA approved the study to move forward at a dose of 25mg/week for 6 months (partial-hold)
- ANP are exploring the conditions that would allow MS patients to receive higher doses including potentially generating additional data while monitoring the progress of the DMD trial which could provide support for undertaking studies in MS patients at the FDA approved dose

Next step for program: to establish plan/conditions for dosing in future clinical studies

Select ASX listed Companies in active clinical development*

Company	Product/Therapeutic	Event	Market Cap A$M
Actinogen Medical (ASX:ACW)	Xanamem (Alzheimer's disease)	Reached half way point in recruitment in 174 pt trial (across 20 sites in the US, UK and Australia)	$33m
Benitec Biopharma (ASX:BLT)	BB-101(DNA construct producing antisense RNA to EGRF) (head and neck squamous cell carcinoma)	Commenced 30 pt Phase II study; 5-8 sites across the USA and Russia	$41m
Imugene (ASX:IMU)	IMU-131 (HER-Vaxx) (cancer vaccine)	Reported no safety, toxicity or tolerability issues with dosing of pts in first cohort (3pts).	$94m
Immutep (ASX:IMM)	Eftilagimod-alpha (LAG-3Ig fusion protein) (metastatic melanoma)	Initiated 30mg cohort (6 pts) in Phase I trial. In combination with pembrolizumab (Keytruda)	$55m
Immuron (ASX:IMC)	IMM-124E (NASH)	133 pt Phase II trial delivered mixed results. Effects on LPS, ALT and AST levels were observed, but no significant effect on liver fat levels.	$54m
Paradigm Biopharmaceuticals (ASX: PAR)	Pentosan Polysulphate Sodium (PPS) (knee osteoarthritis)	Reported 50% recruitment reached in randomised, double blind, placebo controlled Phase IIb trial. 100 subjects.	$35m
	Pentosan Polysulphate Sodium (PPS) (Ross River virus)	Reported 70% recruitment reached in randomised, double blind, placebo controlled Phase IIb trial. 24 subjects.	

** Extracted from Bioshares No. 738 – 29 March 2018 [Quarterly Review]*



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